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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,962	11/26/2003	Uwe B. Sleytr	MAT-0004	9011

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EXAMINER	
NAFF, DAVID M	
ART UNIT	PAPER NUMBER
1657	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/18/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/722,962	SLEYTR ET AL	
	Examiner	Art Unit	
	David M. Naff	1657	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 September 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,5,8-14 and 16-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 4, 5, 8-14 and 16-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

An amendment of 9/18/06 in response to an office action of 6/28/06 amended claims 14, 5, 11 and 13, canceled claims 2, 3, 6, 7 and 15, and added new claims 18 and 19.

Claims examined on the merits are 1, 4, 5, 8-14 and 16-19, which are all claims in the application.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 4, 5, 8-14 and 16-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Support is not found in the specification for one of the steps comprising forming functional molecules on the S-layer proteins as in lines 12-13 of claim 1. The specification does not disclose any of the steps forming the functional molecules on the S-layer proteins as claimed.

Support is not found in the specification for an electrochemical boundary layer as required in line 15 of claim 1. This term is not recited in the specification.

Claim Rejections - 35 USC § 112

Claims 1, 4, 5, 8-14 and 16-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention for the type of reasons set forth in the previous office action of 6/28/06.

The claims are confusing and unclear by failing to set forth clear, distinct and positive method steps in the order in which they are performed using terms that are clear as to meaning and scope so the steps have a contiguous relationship and each step and conditions required have clear antecedent basis, and it is clear how each step functions in the method in relation to all other steps.

Claim 1 is unclear by setting forth steps (lines 1-11), and then setting forth conditions used in the steps. The conditions required for each step should be recited when the step is required.

In lines 12-13, claim 1 is unclear as to steps that are one of the steps.

In line 9, claim 1 is unclear as to material having the crystalline structure required.

In line 15 of claim 1, "electrochemical boundary layer" is uncertain as to meaning and scope, and structure required. The specification does not describe such a layer.

In line 20 of claim 1 and where recited in other claims, there is not antecedent basis for "the substrate".

In line 21, claim 1 is unclear as to which solution contains the electrode since there is not antecedent basis for "the solution".

In line 2 of claims 4 and 5 and where recited in other claims "deposition" is confusing since claim 1 requires depositing.

In line 3 of claim 8, "in particular" makes unclear as to whether denaturing or renaturing is required.

In line 3 of claim 9, "time-varied potential curve" is uncertain as to meaning and scope. Additionally, how can a "curve" control deposition and/or forming a crystalline structure?

In line 3 of claim 11, there is not antecedent basis for "the run through the solutions", and it is unclear as to physical steps that constitute "run through the solutions".

In line 2 of claim 12, the meaning of "electrically impressed on the substrate" is uncertain. Additionally, there is not antecedent basis for "when the solutions are changed".

Claim 14 is unclear how functional molecules are deposited on the substrate simultaneously with the deposition of the S-layer proteins.

In line 2 of claims 16 and 17, there is not antecedent basis for "the S-layer stratum", and in line 3 of the claims there is not antecedent basis for a substrate having positions defined by a crystalline structure.

In line 2 of claims 18 and 19, the meaning of "controlled potentiostatically" is uncertain.

In line 3 of claim 19, "time-separated manner" is uncertain as to meaning and scope, and there is not antecedent basis for "the solution and/or the substrate".

Claim Rejections - 35 USC § 103

Claims 1, 4, 5, 8, 9, 14 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sleytr et al (6,296,700 B1) in view of Pum et al (12 on 1449) and Pum et al (9 on 1449), and if necessary in further view of Sleytr et al (11 on 1449) or Kupcu et al (14 on 1449) or Sleytr et al (15 on 1449) for reasons in the previous office action and for reasons herein.

The claims are drawn to a method for the production of a layer of functional molecules on a carrier surface using a surface layer of S-layer proteins as a carrier of the functional molecules. The method involves depositing a solution containing S-layer proteins on a carrier surface, and a two-dimensional crystalline structure is configured in the layer. The S-layer proteins in solution have an electrical charge and an electrochemical potential difference is created between the solution and carrier surface.

Sleytr et al ('700) disclose depositing a crystalline layer of S-layer proteins on a surface of a carrier, and immobilizing functional molecules on the S-layer proteins (paragraph bridging cols 2 and 3).

Pum et al (12) disclose depositing S-layer proteins on a surface for immobilizing functional molecules (paragraph bridging the cols on page 10). The formation of coherent crystalline arrays depends on

factors including ionic strength and surface properties of the substrate (page 9, left col).

Pum et al (9) disclose immobilizing functional molecules on recrystallized S-layer proteins (paragraph bridging the cols on page 1687). Due to the proteins having a charge, the proteins orient themselves against a charged phospholipid film (page 1687, left col, lines 14-20).

When depositing a crystalline layer of S-layer proteins on a surface of a carrier as disclosed by Sleytr et al ('700), it would have been obvious to provide an electrochemical potential difference between a solution containing the proteins and the carrier surface as suggested by Pum et al (12) disclosing that formation of a crystalline array depends on ionic strength and Pum et al (9) disclosing that the proteins orient themselves against a charged film. Sleytr et al (11), Kupcu et al (14) and Sleytr et al (15) further disclose forming crystalline layers of S-layer proteins on a surface for immobilizing molecules that are functional, and if needed would have further suggested conditions for forming layers of S-layer proteins. The condition of dependent claims would have obvious from conditions disclosed by the references.

Response to Arguments

The amendment urges that the invention is based on the principal concept of controlling the modifying process of the bonding of the S-layer molecules after their adsorption to the substrate surface in an

electrical way using an electrode for separated control of the steps of deposition and crystallization.

However, as set forth in the rejection, Pum et al (12) and (9) would have suggested depositing the crystalline layer of S-layer proteins on a surface of a carrier using an electrochemical potential difference between a solution containing the proteins and the carrier surface. The use of an electrode would have been an obvious way to provide the electrochemical potential.

Double Patenting

Claims 1, 4, 5, 8, 9, 14 and 16-19 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-5 of U.S. Patent No. 6,296,700 B1 in view of Pum et al (12) and Pum et al (9), and if necessary in further view of Sleytr et al (11) or Kupcu et al (14) or Sleytr et al (15).

When producing a crystalline layer of S-layer proteins on a surface for depositing functional molecules as required by the patent claims, it would have been obvious to provide an electrochemical potential difference between a solution containing the proteins and the surface as suggested by Pum et al (12) disclosing that formation of a crystalline array depends on ionic strength and Pum et al (9) disclosing that the proteins orient themselves against a charged film. Sleytr et al (11), Kupcu et al (14) and Sleytr et al (15) further disclose forming crystalline layers of S-layer proteins on a surface for immobilizing molecules that are functional, and if needed would have further suggested conditions for forming layers of S-layer

proteins. The condition of dependent claims would have obvious from conditions disclosed by the references.

Response to Arguments

This rejection has not been separately traversed.

Conclusion

Claims 10-13 are free of the prior art.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David M. Naff whose telephone number is 571-272-0920. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jon Weber can be reached on 571-272-0925.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

David M. Naff
Primary Examiner
Art Unit 1657

DMN
12/11/06